

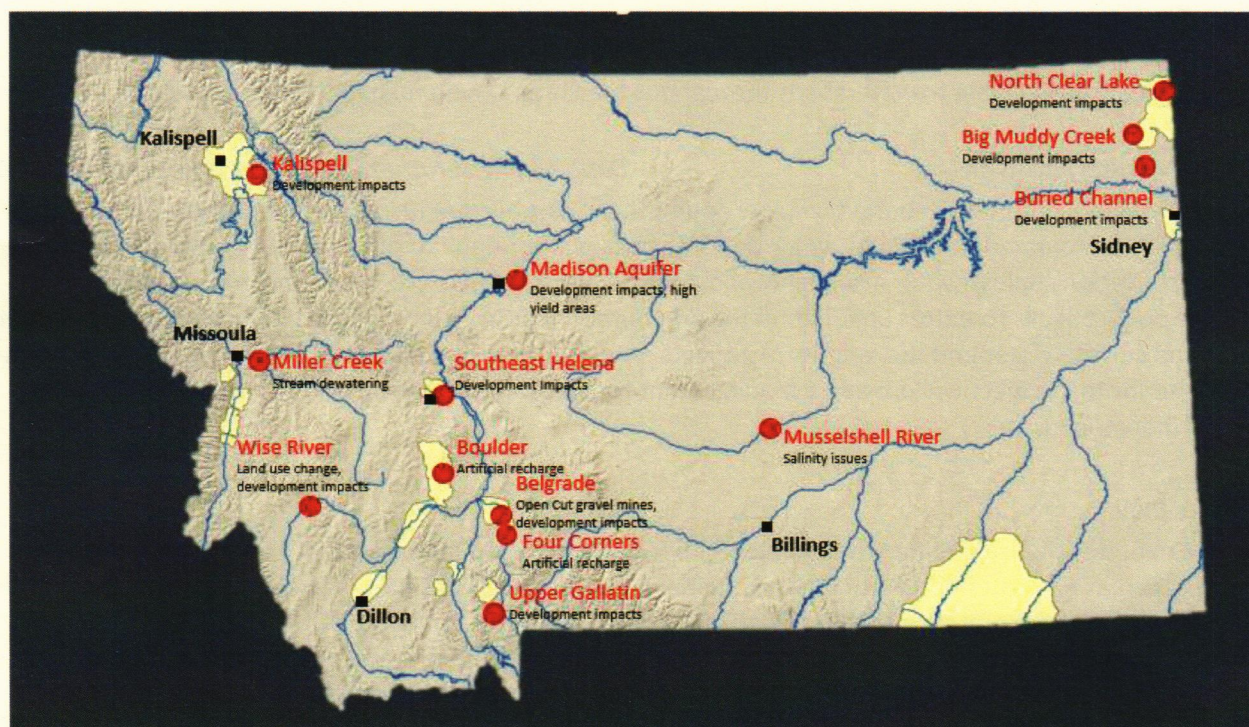
Ground Water Investigation Program (GWIP)

GWIP answers locally identified, site-specific questions prioritized by the Montana Ground Water Steering Committee (MCA 85-2-525). As mandated by the Montana Legislature, GWIP conducts research on the most urgent water issues in the State.

Project Nominations 2019

Thirteen projects have been nominated to date to the Ground Water Steering Committee (GWSC) for 2019. Project sponsors include local, State and Tribal entities. This document provides a brief description of each project, and the timeline and process for choosing GWIP projects.

Location Map for 2019 Project Nominations



- Active or completed GWIP projects
- Proposed GWIP projects

WATER POLICY INTERIM
COMMITTEE 2017-18

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Exhibit 7

GWIP Information

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<http://www.mbmgs.mtech.edu/gwip/gwip.html>



MONTANA BUREAU OF MINES AND GEOLOGY

Ground Water Investigation Program

PROJECTS NOMINATED FOR 2019

Big Muddy Creek, Northeastern Montana

Fort Peck Assiniboine & Sioux Tribes

Big Muddy Creek flows out of Canada, forms the eastern boundary of the Fort Peck Indian Reservation, connects with the Clear Lake groundwater system near Medicine Lake National Wildlife Refuge and joins the Missouri River just west of Culbertson. The connection between the shallow aquifers and Big Muddy Creek is poorly understood. This project will investigate the effect of potential new groundwater development on surface water and nearby wetlands near Medicine Lake; a concern of both the Tribe and the National Fish and Wildlife Service. The understanding the hydrologic systems and a groundwater model produced as part of this project will guide future groundwater management decisions.

Boulder Watershed, Artificial Recharge

Lower Jefferson River Watershed Council

One of the major problems in the Boulder Valley and much of Montana is the lack of late season, cool stream flows. This demonstration project will use existing irrigation infrastructure within the water rights period-of-use to augment groundwater recharge and increase late summer surface water flows. A groundwater flow model previously developed by GWIP will identify potential demonstration sites where groundwater storage and the timing of the irrigation return flows will supplement surface water during the late summer. The documentation and demonstration of this methodology will be transferrable to watersheds throughout the State to help manage groundwater and surface water.

Buried Channel Aquifer, Bainville

Department of Natural Resources and Conservation (DNRC)

Withdrawals from the Missouri River buried channel aquifer near Bainville are increasing in response to irrigation, oil and gas, and subdivisions demands. Senior water rights holders will continue to object to new groundwater development applications unless water availability and adverse effects on surface water and groundwater are identified.. This project seeks to better understand the aquifer boundaries and properties, the connection between groundwater and surface water and the long-term impacts of increased groundwater development. The groundwater model developed for this project will provide a management tool to evaluate permits for new wells for irrigation, municipal, and industrial uses.

East Flathead Valley

DNRC

A recent water right decision regarding groundwater withdrawals for a commercial activity on the east side of the Flathead Valley is creating contention amongst stakeholders. Conflicts will continue as land is subdivided and if the compact between the Confederated Salish Kootenai Tribes and Montana is implemented. The results of this project will include an improved description of how groundwater and surface water interact and better quantification of recharge along this side of the valley. A groundwater flow model of this focus area will be developed and released for future use by water managers and decisions makers to accurately assess future groundwater withdrawal applications.

Four Corners, Artificial Recharge

Four Corners Community Foundation

The Gallatin's Valley escalating growth, and the effects of climate change, present challenges for managing the water supply. The proposed project will look at strategies to manage water retention in the Gallatin Valley by storing groundwater in times of abundance. Accurately designed and implemented, this stored water may support surface and groundwater levels in times of scarcity. A site with existing infrastructure (existing monitoring wells, an infiltration basin, and abandoned canals) will serve as the demonstration. Project results can inform policymaking and planning, both locally and statewide.



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Madison Aquifer, Central Montana

DNRC

The Madison aquifer is a potentially important aquifer in central Montana. The potential that groundwater withdrawals will deplete surface water creates regulatory uncertainty, and is an impediment to development of the aquifer. The project purpose is to develop guidance and tools for evaluating the hydraulic connection of the aquifer to surface water and to identify areas with the greatest potential for drilling high yield wells with good quality water in the Madison aquifer. The results will provide DNRC with a tool that can be used to evaluate applications for groundwater in central Montana and other areas of the state where the Madison aquifer is present.

Miller Creek, Missoula

Missoula Water Quality District (MWQD)

Miller Creek is a tributary to the Bitterroot River. Development pressure from Missoula has resulted in land use changes from agricultural to residential, with population in this area expected to more than double by 2030. This project will evaluate the relationship between the deeper groundwater system, the shallow aquifer, and Miller Creek. Understanding this interaction will determine the reasons for Miller Creek drying up in the late summer-early fall and the implications of increased groundwater withdrawals in the deeper groundwater system. Results of this project will guide the City/County growth policy and inform restoration projects.

Musselshell River, Central Montana

Musselshell Watershed Coalition

High salinity in the Musselshell River is an issue for irrigators who rely on surface water for agricultural needs. Every year, salinity levels approach or exceed the recommended irrigation-water limit, set at 3,000 $\mu\text{S}/\text{cm}$. This GWIP nomination proposes to determine the sources of salinity in the Musselshell River between Musselshell and Mosby. The focus area is near Melstone and includes the Delphia-Melstone Canal system and Horse Creek Coulee. The results of the GWIP investigation will address the salinity implications of a proposed off-stream storage reservoir and identify areas where irrigation changes could result in better control of irrigation-related salt mobilization.

North Clear Lake Aquifer, Northeastern, Montana

Sheridan County Conservation District

The North Clear Lake Management area is the most intensely developed area within the Sheridan County Groundwater Reservation. The GWIP project proposes to evaluate groundwater sustainability for this management area and the potential effects on surface water and existing wells from projected new withdrawals. The proposed project builds upon the Clear Lake GWIP Aquifer Investigation that included a numerical groundwater model for the South Medicine Lake Management Area (Reports in Review, 2018). Sheridan County Technical advisory committee will use the improved understanding and numerical groundwater model to allocate water and issue permits for irrigation water use.

Open Cut Mining, Gallatin Valley

Montana Department of Environmental Quality (DEQ)

The Belgrade area has 11 gravel pits that are currently being mined or are permitted for future mining. Due to the shallow water table in this area, gravel mines intercept groundwater. This project will address the effects of open cut mining on groundwater flow and surface water. Results will be used by DEQ to determine the factors that are important for permitting new mines, and provide information for canal companies and county decision makers affected by the implications of open cut mining on water resources. Results could be used as a framework for similar studies in other areas.

Southeast Helena Valley

Lewis and Clark Water Quality District

Groundwater depletion due to residential development has been documented in the Helena Valley. This proposed project will evaluate groundwater availability and the potential for additional depletion due to increasing subdivision groundwater usage. The difference between using individual domestic wells or higher capacity public water supply wells will be evaluated. A numerical groundwater model of the southeast Helena Valley will be developed to provide the basis to evaluate the source and magnitude of depletion under current and future groundwater development scenarios. Given the current depletion issues, the project results are critical for developing sustainable water solutions for long-term growth planning in the Helena Area.



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Upper Gallatin River Corridor

Gallatin River Task Force

The Upper Gallatin Corridor, located east of Big Sky, is undergoing rapid development. This project proposes to assess cumulative effects of existing and future development on water quality and quantity in the local aquifers and the Upper Gallatin River. Understanding the impacts of development in the Upper Gallatin Watershed will address concerns of the Gallatin Valley users downstream in the watershed. The proposed study will inform future planning and decision making to determine viable options to allow for additional growth while balancing upstream and Valley community concerns for water quality and quantity.

Wise River

Big Hole Watershed Committee (BHWSC)

The Wise River is the largest tributary to the Big Hole River and is an important cold-water source for the Big Hole River. Water quality impairments have been documented in the watershed that include flow alterations and increased water temperature. The purpose of this project is to evaluate potential impacts to Wise River from conversion of flood to pivot irrigation and from increased groundwater development by domestic wells. The role of groundwater irrigation return flows to the river must be understood and included in any successful water management planning; as does the stream and groundwater depletion that may result from additional domestic wells. Results of this investigation will support recommendations for irrigation, climatic resiliency, and drought management. GWIP will also provide information on the use of groundwater triggers in drought management planning.

Project Nomination Timeline (2018)

The submittal, review and ranking of projects are completed on or before indicated dates.

- Jan:** Pre-announcements of upcoming nominations on web pages and emails by GWIP.
- Feb 7:** Requests for GWIP project nominations are distributed jointly by the GWSC and GWIP.
- April 16:** Nomination packages are returned to GWIP by the project sponsors.
- July 2:** GWIP prepares project summaries and the draft-ranking matrix (excluding the GWSC discretionary points). The GWSC voting and ex-officio members are sent the project nomination documents.
- Aug 3:** The GWSC voting and ex-officio members review the proposals; create their individual project ranking based on their experience and the contingency they represent, and submit project comments to the GWSC Chair.
- Aug 31:** An informational public meeting is held to discuss the projects.
- Sep 14:** The GWSC voting members reconvene to assign discretionary points based on their professional judgement, directives from their perspective agencies, information from the ex-officio members and the public, and other pertinent information.
- Sep 28:** The project ranking is publicized.

For more information on the project nomination timeline: http://www.mbm.mtech.edu/gwip/gwip_ranking.html